

there are four or five species of this genus. The second genus, *Stoliczkaia*, is without pores or has them microscopically developed, the internal tubulation being remarkably close; it contains two species.

The sections of these spheres present microscopical appearances second to none in their beauty; and the polarizing apparatus enables cleavage- and other lines of a non-organic nature to be distinguished. I must apologize for this brief notice; but as the details are about to be published by the Indian Government, I am not at liberty to anticipate too much.

Sept. 5, 1878.

XXXV.—*Remarks upon the Thalassinidea and Astacidea of the Pacific Coast of North America, with Description of a new Species.* By W. N. LOCKINGTON.

THALASSINIDEA.

Family Gebidæ.

Gebia pugettensis, Dana.

Gebia pugettensis, Dana, U.S. Ex. Exp., Crust. i. 510, pl. xxxii. fig. 1; Stimpson, Crust. & Echin. P. S. N. Am. p. 48.

This species is exceedingly abundant in San Francisco and Tomales Bays, and frequently attains a length of six inches or even more.

The subterranean passages made by it are usually nearly perpendicular, about an inch across, and very neatly rounded in section, with the walls smooth as if plastered, the smoothness resulting entirely from the pressure of the animal's body as it pushes itself upwards and downwards by the action of its terminal abdominal segments.

The burrows are not confined to strata of sand, but are abundant also in mud, in sandy shingle, and even among rocks, ranging upwards almost to high-water mark, and downwards to at least three or four fathoms, since large specimens were brought up in abundance by the dredging-machines in Oakland Harbour.

Almost every specimen collected in Tomales Bay, in the month of May, bore upon its abdominal feet either the curious Isopod *Phyllodurus abdominalis* (Stimpson, *op. cit.* p. 71), or a small bivalve mollusk, *Pythina rugifera*, Carpenter.

While most of the smaller individuals are accompanied by a pair of *P. abdominalis*, the larger specimens were free from this crustacean, but in many cases bore the mollusk above mentioned.

In only one case, out of over a hundred specimens dug up in Tomales Bay, were the mollusk and the Isopod found in company upon the same *Gebia*; and in this case the *Gebia* was of middling size, and the mollusk very small. On specimens collected July 4 I did not find the bivalve, and the *Phyllodurus* was less common than in May.

In San-Francisco Bay I have not as yet detected *Pythina rugifera*, but *Phyllodurus* is sufficiently common.

Gebia pugettensis is on record from various points along the Pacific coast from Puget Sound to Monterey, and also from San-Quentin Bay, west coast, Lower California.

Gebia spinigera, S. I. Smith.

Gebia spinigera, S. I. Smith, Report Peabody Acad. Sci. 1869, p. 92.

A large number of specimens, all females, were collected by J. A. M'Neil, at the island of Aseredores, 20 miles north-west of Corinto, Nicaragua; and a few were also collected in the Gulf of Fonseca.

Gebia longipollex, T. H. Streets.

Gebia longipollex, T. H. Streets, Proc. Acad. Nat. Sci. Phil. Dec. 1871, p. 242.

This species, having a tridentate front, and a small spine on the carapax over each antenna, is described in a "Catalogue of Crustacea from the Isthmus of Panama," collected by J. A. M'Neil, and probably came from the Pacific coast of the isthmus.

Gebia rugosa, nov. sp.

Rostrum short, thick, obtuse at tip, curved downwards to the level of the centre line of the cornea of the eye. Upper orbital margin curving outwards convexly; margins of anterior portion of carapax, posterior to the curve, straight, but gradually divaricating. Upper surface of rostrum and carapax, to about halfway to the dorsal suture, beset with small tubercles and hirsute.

Cornea black, visible from above between the rostrum and the outward curve of the carapax.

Antennæ projecting beyond rostrum to a length about equal to that of carapax, sparsely setose.

Antennulæ less than half the length of antennæ, branches of flagella equal, the upper stouter than the lower.

Chelipeds equal; merus compressed, smooth, equal in length to the hand; carpus smooth, about half the length of upper margin of propodus; propodus smooth, sparsely hirsute, the hairs most abundant on inner side; pollex short, sharp-pointed, curved regularly upwards; dactylus less than half the length of palmar portion of hand, which is thickly hirsute, curved regularly downwards, its tip passing beyond that of the dactylus.

Four hinder pairs of pereopodi compressed, the posterior margins and tips of the propodi hirsute, also, to a less extent, the posterior margins of the carpi.

Anterior margin of the merus and propodus of the second pair set with long hairs.

Posterior margin of fourth abdominal segment beset with short stiff hairs; the three posterior segments and the lateral caudal appendages complexly wrinkled above, the rugæ smooth. Terminal segment broader than long, distal margin longer than proximal; caudal processes large, filling up the space between the terminal and fifth segments.

Length of larger specimen 25 millins.

Two specimens of this species were collected at Port Escondido, Gulf of California, under stones and coral at low tide, August 1876.

Callianassa californiensis, Dana.

Callianassa californiensis, Dana, Proc. Acad. Nat. Sci. Phil. 1854, vii. p. 175; Stimpson, Crust. & Echin. P. S. N. Am. p. 49, pl. xxi. fig. 4.

Stimpson records the occurrence of this species at Fort Steilacoom, Puget Sound (*Suckley*), and near the mouth of San Francisco Bay (*Trask*). I have not been fortunate enough to meet with it in the latter locality, but have found it in abundance near Preston's Point, Tomales Bay.

In the museum of the Cal. Acad. Sci. are several specimens from Mutiny Bay, Alaska.

Both the anterior feet of the female are of a bright rose colour; but the large hand of the male is nearly of the same tint with the body.

Upon specimens I collected in Tomales Bay were numerous minute red parasites which I neglected to examine, but conjecture to have been Acarida.

Callianassa gigas, Dana.

Callianassa gigas, Dana, U.S. Ex. Exp., Crust. i. 212, pl. xxxii. fig. 3 :
Stimpson, Crust. & Echin. P. S. N. A. p. 49.

I have not met with this species in the vicinity of San Francisco; nor does it occur among the numerous species of Crustacea, including two new Thalassinidea, collected by Fisher on the coasts of the Gulf of California.

Dana met with it in Puget Sound.

Callianassa longimana, Stimpson.

Callianassa longimana, Stimpson, *op. cit.* p. 50, pl. xxi. fig. 5.

This species, originally collected at Fort Steilacoom, Puget Sound, by Dr. Suckley, occurs also at Santa-Rosa Island, one of the Santa-Barbara group, at San Diego, and at San-Quentin Bay, Lower California. Doubtless it occurs at points intermediate between these widely separated localities.

Callianidea typa, M.-Edwards.

Callianidea typa, M.-Edwards, Hist. Nat. des Crust. pl. xxv. *bis*,
figs. 8-14.

It was with some surprise that I found, among other specimens of Crustacea collected by Mr. W. J. Fisher in the Gulf of California, some examples of this species, first collected by Messrs. Quoy and Gaimard upon the coasts of New Ireland. After careful examination I cannot detect any difference between my specimens and the figures given by Milne-Edwards, although the localities are so wide apart.

The specimens, three in number, were taken at La Paz at low tide.

Total length of second largest specimen 50 millims.; length of smaller hand 10, of larger 15. Length of manus of larger cheliped of largest specimen 24 millims., of palmar portion 14, of carpus 3, of merus 11; of manus of smaller cheliped 15, of carpus 8.5, of merus 8.5; width of manus of larger cheliped 10.

ASTACIDEA.

Panulirus interruptus, Randall.

This is the "lobster" of the San-Francisco market. Large numbers are caught at Santa Barbara and other points south of San Francisco.

Stimpson states that it inhabits rocky ledges in rather deep water.

Panulirus guttatus, Gray.

Dr. T. Hale Streets mentions this species among those collected by J. A. M'Neil upon the Isthmus of Panama, presumably from the Pacific coast.

Panulirus americanus, Lamarck.

Also included in the above-mentioned catalogue.

Panulirus gracilis, Streets.

Panulirus gracilis, Streets, Proc. Acad. Nat. Sci. Phil. 1871, 225, pl. xi. fig. 2.

This form is described by Streets from a specimen 0·9 inch in length, probably a very young individual.

Astacus Gambelii, Agassiz.

This very distinct species appears to be peculiar to the central region of North America; all the specimens I have seen have been collected east of the Sierra Nevada.

It is easily distinguished from the species inhabiting the rivers flowing into the Pacific, by the pilose areas upon the upper surface of the chelæ, and by the simple rostrum.

Astacus nigrescens, Stimpson.

Astacus nigrescens, Stimpson, Crust. & Echin. P. S. N. A. p. 52.

This species appears to be found in most of the larger brooks of the central counties of California, such as the Alameda Creek, Alameda Co., Coyote Creek, Santa-Clara Co., and San-Joaquin Slough.

It is occasionally sold in the markets of San Francisco. Adult specimens exceed 4 inches in length.

Astacus klamathensis, Stimpson.

Astacus klamathensis, Stimpson, *op. cit.* 54.

This small species, first found in Klamath Lake by Dr. Newberry, has also been taken in the Columbia River; and I have collected several individuals in Eel River, Humboldt Co., California.

Astacus Trowbridgii, Stimpson.

Astacus Trowbridgii, Stimpson, *op. cit.* 53.

The terminal spine of the rostrum is less slender than in *A. nigrescens*; and a single prominent antero-lateral tooth on

each side supersedes the five or six small sharp spines of that species. The edges of the terminal spine are serrated.

Astacus læviusculus, Dana.

Columbia River, Puget Sound.

San Francisco, Aug. 28, 1878.

XXXVI.—*On the probable Nature of the Animal which produced the Stromatoporidæ, traced through Hydractinia, Millepora alcicornis, and Caunopora, to Stromatopora.* By H. J. CARTER, F.R.S. &c.

As there are undoubtedly several species of *Stromatopora*, and each species may have several varieties, while the whole may be variously altered by mineralization, these contingencies are too numerous for me to undertake the palæontology of the whole group, and therefore I shall confine myself solely to the probable nature of the animal which produced them.

I need hardly premise that in proportion to the knowledge of beings actually living will be that of those which have passed away—that is, that it is impossible to be a good palæontologist without being a good morphologist, either specially or generally, and therefore that a knowledge of geology alone cannot make a good palæontologist.

Take, for instance, the following fact, which no amount of fossil material could afford, and which nothing but a knowledge of recent structure could supply, and the foregoing premise becomes evident.

Thus, the embryo of *Hydractinia echinata* begins its structure, both soft and hard, by developing a sarcodic membrane which is traversed by a vascularity consisting of *rami*, *ramusculi*, *ramuscunculi*, &c., over which minute points of chitinous or horny matter subsequently appear along the course of the vessels (that is, outside their walls), which, after having grown into branched elements, ultimately become incorporated in the formation of the fibre of the polypary or cœnenchyma, after the manner of *Millepora alcicornis*, as will be more particularly explained by-and-by ('Annals,' 1873, vol. xi., and 1877, vol. xix.). When the soft parts are abstracted the *spaces* alone which they occupied are left, whereby the cœnenchyma becomes, as it were, the *mould* of the vessels. *Pari passu* with the development of the cœnenchyma is that of the polypites and the development of new vascular *foci*, from which it happens